Learning and Technology Policy Framework

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Alberta
LEARNING

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INTRODUCTION

Whether it is used to enhance classroom learning, to provide skilled trades training to apprentices and journeymen at their place of work, or to expand the range of learning options for non-traditional learners and people living in remote geographic locations, information and communication technology (ICT) is an important tool for extending the reach and increasing the flexibility and responsiveness of Alberta's lifelong learning system.[1]

Technology can provide greater access to resources, expose students to real-world problems and authentic contexts for learning, and provide alternative methods of representing and communicating their knowledge. It fosters innovation, facilitates dialogue and offers potential for developing new practices among the education and research communities.

In addition, the acquisition of ICT skills is fundamental to participation in the knowledge-based economy, and to the ability to discern and fully benefit from the technologies available in today's society.

Further, ICT plays a significant role in enhancing learning system management, coordination, and collaboration.

Together, these roles of technology (learning delivery, knowledge and skill acquisition, learning system management, innovation) contribute to the achievement of the Campus Alberta vision for the learning system:

> *Albertans will have the opportunity to participate in lifelong learning supported by a learning system in which learning providers collaborate to deliver quality and innovative learning opportunities – where and when Albertans need them – to enhance their social, cultural, and economic well being.*

The Alberta Commission on Learning, in its October 2003 report, recognizes the transformational impact of technology on learning and the need to integrate technology fully into Alberta's learning system.[2]

Within this context, technology offers the potential to:

- increase access to learning opportunities
- adapt teaching to different learning styles, preferences and paces
- customize learning materials and services
- provide access to interactive educational resources
- expand research and knowledge creation
- individualize the tracking and recording of learning progress
- develop new learning communities for the sharing of knowledge and best practices
- improve information management and administrative processes.

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[1] The definition of "technology" is evolving with the convergence of digital, telecommunications and television technologies. For the purposes of the Framework, "ICT" and "technology" are used interchangeably and a broad definition of technology (i.e. beyond computer-based technologies) is implied.

[2] Alberta's Commission on Learning (2003). *Every child learns, every child succeeds: report and recommendations*. Edmonton, AB: Author.

Rationale for a Policy Framework on Learning and Technology

The Learning and Technology Policy Framework is proposed to provide direction and coordination for the use of technology in Alberta's learning system. The Framework will inform Ministry decisions by:

- establishing a context for the assessment of trends, needs, best practices, and new initiatives
- ensuring that investment in technology is consistent with learning system objectives/priorities and optimizes benefits to learners
- clarifying Ministry and stakeholder roles in the area of technology.

Scope of the Framework

The scope of the Learning and Technology Policy Framework includes:

- all sectors of the learning system (i.e. K-12, adult learning, apprenticeship and industry training)
- a range of technology purposes (e.g. knowledge and skill acquisition, learning delivery, research and innovation, learning system management)
- learning and technology stakeholders (e.g. traditional and non-traditional learners, educators, parents, administrators, researchers, employers, not-for-profit organizations, industry)
- a number of learning environments (e.g. school/post-secondary institution, home, workplace, virtual)
- a variety of learning delivery modes (e.g. classroom, online learning[3], blended classroom/online learning, multimedia, audio/videoconferencing)
- formal and informal learning opportunities.

Key learning and technology components and activities that may be informed by this Framework include research, infrastructure, digital content, learning outcomes, professional growth, learning delivery, learning supports, technology planning and funding, learning information systems, and innovation.

[3] "Online learning" involves the use of Internet-based technologies to deliver instruction, access learning resources, and facilitate communication among learners and educators for both face-to-face and distance learning.

VISION

The following vision statement is proposed to guide the use of technology for learning in Alberta:

> *Information and communication technology supports Alberta's globally recognized learning community by enhancing learning delivery, knowledge and skill acquisition, learning system management, and innovation.*

PRINCIPLES

The following principles are proposed to focus the use of technology on learning:

Learner-centred Technology is used to enhance learning opportunities and to support successful learning outcomes for Albertans.

Accessible Technology is used to expand learning opportunities for all Albertans, including non-traditional learners.

Collaborative Technology is used to build relationships and foster partnerships within the learning community and with other stakeholders.

Accountable Technology decisions are based on learning system/government priorities and the enhancement of learning outcomes, and are evaluated using established performance criteria.

Responsive Technology is used to increase the flexibility of educators to address individual needs and preferences.

Innovative Technology effectiveness is advanced through the identification, evaluation, and, where appropriate, adoption of emerging technologies and promising practices.

Equitable Technology infrastructure and applications are consistent and readily available, within reason, across the learning system.

GOALS

The following goals will provide direction for the use of technology and support the achievement of Alberta learning system objectives:

1. **Access to quality learning opportunities is expanded**

   The use of ICT reduces geographical and time constraints, enabling Albertans to access new learning opportunities across the province and around the world. Technology is beneficial in increasing learning options for rural Albertans and reducing barriers to learning for people with disabilities. Stakeholders will have the tools to identify quality online learning opportunities.

2. **Learning is enriched**

   The availability of the Internet and sophisticated multimedia tools is changing approaches to learning delivery – in the classroom, in distance learning, and in other learning contexts. ICT provides new ways to present information and illustrate concepts, and provides educators and learners with access to a broad array of learning resources. It offers learners new approaches to demonstrate their learning. It also facilitates the development of diverse, global learning communities and promotes information sharing and dialogue among learners and educators.

3. **Learning outcomes are improved**

   ICT will be used to improve learner participation, achievement, and satisfaction with the learning process. The ability to adapt learning content, delivery, pace, and structure to individual needs and preferences may be particularly beneficial for non-traditional learners and learners with special needs. ICT will support parents and employers in their efforts to assist learners to meet learning and career objectives. Educator expertise in pedagogy and facilitating learner success will be recognized.

4. **Information and communication technology skills of Albertans are enhanced**

   The ICT skills of Albertans will be improved to ensure their competitiveness in a knowledge economy, and to enable them to use technology to address other interests and needs.

5. **The efficiency of learning system management is improved**

   ICT supports the policy, planning and accountability processes essential to effective learning system management. Learning information systems and quality data will inform Ministry and learning provider decisions. Administrative burden will be reduced.

6. **Research and knowledge creation are advanced**

   Information and communication technology enhances theoretical and applied research capability and facilitates academic inquiry. The use of technology in the learning system will be informed by new technologies, tools, and practices developed by the education and research communities and the private sector. Mechanisms to disseminate learning and technology research findings will be enhanced.

7. **Markets for learning programs, resources and services are expanded**

   As part of the International Education Strategy, Alberta learning providers will obtain access to worldwide markets for their programs and services. Alberta will be recognized as an international leader in online learning. In addition, innovative technologies, applications, and resources will enhance Alberta's presence in international markets.

LEARNING AND TECHNOLOGY POLICY FRAMEWORK: AN OVERVIEW

VISION

Information and communication technology supports Alberta's globally recognized learning community by enhancing learning delivery, knowledge and skill acquisition, learning system management, and innovation.

GOALS

LEARNING

- Increased access to learning opportunities (Goal 1)
- Enriched learning (Goal 2)
- Improved learning outcomes (Goal 3)
- Acquisition of ICT skills (Goal 4)

LEARNING SYSTEM MANAGEMENT

- Reduced administrative burden (Goal 5)
- Quality data for decision making (Goal 5)

INNOVATION

- Enhanced research capability and knowledge transfer (Goal 6)
- Development of new technologies, applications, practices (Goal 6)
- Expansion of programs, products, services to new markets (Goal 7)

POLICY DIRECTION

- Research
- Infrastructure
- Digital Content
- Learning Outcomes
- Professional Growth
- Learning Delivery
- Learning Supports
- Technology Planning and Funding
- Learning Information Systems
- Innovation

POLICY, PLANNING, FUNDING AND ACCOUNTABILITY

LEARNING AND TECHNOLOGY POLICY DIRECTION

This section outlines the policy direction, rationale, outcomes and potential new actions for ten key learning and technology dimensions within Alberta's learning system. (See Appendices I and II for an overview and description of current activities in each of these areas.)

1. Research

Policy Direction

Research will inform decisions about the use of technology for learning.

Rationale

Research is an important tool in managing and keeping pace with technological change. It is a valuable source of information for technology policy, planning, and decision making, and facilitates improvements to initiatives in the process of being implemented.

The rapid evolution of learning technologies poses challenges in assessing ICT potential and limitations for learning. Where research has been undertaken, findings may not be broadly disseminated or may not be appropriate for use in the development of learning system policies and practices. In addition, research on the effectiveness of ICT for learning may be constrained by the availability of resources and the challenges of isolating the impact of technology from the impact of other variables such as learner and family characteristics, teacher/faculty skills, the instructional approach, and the availability of learning supports.

The learning system needs to develop innovative practices and obtain improved information to guide decisions on the use of ICT for learning. Key questions that require further investigation include:

- How may technology best support successful outcomes for learners?
    - For which learners is the use of technology most appropriate? (e.g. age/grade/developmental levels, literacy levels, learning styles/preferences, ICT skill levels)
    - What subjects/disciplines and what forms of learning content are best suited for the use of ICT?
    - What instructional models are most appropriate?
    - How should learning be assessed in an online learning environment?
- How does the use of technology impact the roles of teachers, faculty, instructors, and administrators?
- What is the total cost of ownership of ICT? What are the cost-benefits of using ICT relative to other learning delivery approaches?
- What technical standards are required to ensure the effective use and exchange of learning content, information and data among learning system stakeholders?
- What are the merits and disadvantages of new technologies?
- What innovative practices would be beneficial to implement on a broader scale?

Research collaboration and coordination fosters dialogue and the development of communities of practice, supports system-wide change, ensures that all learning system stakeholders are able to integrate the findings into their own planning and decision-making processes, and optimizes the use of available resources.

Outcomes

- learners, parents, educators, employers, and Ministry officials make effective decisions about learning and technology
- investment in technology is targeted to areas of greatest effectiveness
- effective practices are adopted, where appropriate, across the learning system
- the learning system is better positioned to anticipate and respond to technological change.

Potential New Actions

- work with learning stakeholders, research organizations, and other jurisdictions to implement system-wide, national and international research strategies on learning and technology
- facilitate the development of applied research on teaching techniques and learning outcomes.

2. Infrastructure

Policy Direction

A province-wide learning network, supported by provincial technology standards and solutions, will be developed.

Rationale

The implementation of a province-wide learning network will improve the ability of the system to share resources and increase access to learning opportunities and information by learners, parents, educators and employers.

Factors to be considered in the development of a province-wide learning network include:

- the rollout of Alberta SuperNet, which will provide new opportunities for learners through increased access to online learning, expanded options for collaboration and professional development, and the use of new applications such as videoconferencing and remote video resources
- the need to support interoperability and access by educators, learners and administrators in a secure and appropriate manner
- the increasing expectations of learners, parents, and employers to be able to access the learning system from outside of the learning network
- the need to manage effectively the costs of upgrading and supporting technology, particularly given the rapid pace of technological change
- the ability to filter and manage access to information through the learning system
- the need to support the effective use of ICT within the learning system
- the alignment with the Government of Alberta Enterprise Architecture Framework and standards.

An effective provincial learning network requires ICT infrastructure that is built on standards, provides reliable performance and availability, and is managed in a manner that anticipates and supports the changing needs of the learning system. This involves resources at the inter-provincial or national level, the provincial level, and the jurisdiction or institution level, and includes:

- network infrastructure and management (e.g. filtering, security, access control and communication standards)
- ICT hardware and software to support the interoperability of the learning system
- ICT technical support
- infrastructure design, construction and maintenance to support the installation and upgrading of ICT infrastructure in schools, institutions and learning-related offices.

There is a perception that the existing ICT infrastructure may not meet the growing needs of learners and educators, does not provide a sufficient level of interoperability, and may not be sustainable. Currently, there is a wide variety of technology and implementation of technology across the system.

The extent to which learners, educators, parents, employers, and administrators are able to use the existing ICT infrastructure to address their needs varies significantly by jurisdiction or institution, as does the extent to which the ICT industry supports the learning system.

In addition, it is perceived that there is significant duplication of effort associated with the research and planning for ICT across the learning system. There is also a perception that the costs associated with the acquisition of technology vary significantly across the system.

Alberta's Commission on Learning has endorsed the development of province-wide standards, to be phased in over a period of five years.

Development of learning system architecture, standards and long-term plans is also necessary to guide ICT plans of jurisdictions and institutions. These need to be supported by transition plans and in-service/professional development strategies for individuals involved in the implementation and support of the ICT infrastructure. ICT standards and plans need to be guided by learning system priorities, be based on appropriate research, and consider ICT industry directions.

Responsibility for the provincial network infrastructure, standards, knowledge, skills, and plans is shared among Alberta Learning, Alberta Infrastructure, Alberta Innovation and Science, school authorities, educational institutions, and the ICT industry. Alberta Learning's role is the facilitation of activities required for the provincial learning network.

Outcomes

- the ICT infrastructure provides a basic level of interoperability and support for learners, educators, parents, employers, and administrators
- the infrastructure is affordable and sustainable
- access to technology is equitable across the learning system

- minimal impact on learners, educators, parents, employers, and administrators as they move among schools, jurisdictions or institutions within the learning system
- improved ability to share resources and increase access to learning opportunities and information by learners, educators, parents, and employers.

Potential New Actions

- work with stakeholders to implement province-wide technical standards to facilitate the interoperability of systems and support the exchange of data, files, information, content and resources across the learning system
- work with stakeholders to achieve economies of scale through the licensing and procurement of technologies, applications, and supports with system-wide merit
- work with stakeholders to develop a long-term strategic plan to address learning system technology infrastructure needs.

3. Digital Content

Policy Direction

Learners, parents and educators will have access to quality digital content to support a range of learning activities.

Rationale

Growing expectations for flexible learning opportunities and the expansion of technology infrastructure are increasing demand for digital content. This content may add variety to classroom learning experiences, be incorporated into online learning courses, inform learners, parents, and employers about program requirements, support homework and independent study, or illustrate a concept in the workplace. Formats may include text, diagrams, illustrations, audio/video clips, simulations and animations.

Development of quality digital content is often resource intensive and requires both pedagogical and technical expertise. The cost of acquiring/licensing digital content from other sources may be a barrier to some school authorities, post-secondary institutions, individuals, and employers. Further, such content may not be fully relevant to specific course requirements or user needs.

Learning content repositories have the potential to allow authorized users to share digital content and adapt it to their own use. However, concerns about compensation, digital copyright and ownership of intellectual property may prevent some educators and content developers from participating. Current intellectual property arrangements vary considerably among post-secondary institutions and school authorities, and may be formalized through collective agreements.

Outcomes

- increased volume of quality digital content for stakeholder use
- digital content is developed/acquired in ways that enable it to be shared and adapted, where appropriate, for multiple purposes
- learning programs may be customized to address individual learner need

- copyright and intellectual property rights of content owners/developers are protected
- optimized access to digital content developed/acquired with taxpayer dollars.

Potential New Actions

- work with stakeholders to identify opportunities to develop digital content to address the cultural and second language needs of Alberta learners
- through the Council of Ministers of Education, Canada (CMEC), work with other provincial/territorial jurisdictions to develop a pan-Canadian learning portal that will link provincial/territorial websites and digital content repositories, and facilitate the sharing of online learning resources
- identify opportunities to achieve economies of scale through joint development/licensing/procurement of third-party digital learning resources
- work with post-secondary institutions, the Alberta Apprenticeship and Industry Training Board, and other stakeholders to develop strategies to adapt and expand LearnAlberta.ca to address the needs of adult learners
- develop strategies to link and provide system-wide access to existing and emerging digital content repositories
- identify and communicate best practices in intellectual property agreements that facilitate sharing of digital content while recognizing owner/developer rights
- promote collaborative development of post-secondary/apprenticeship and industry training digital content in areas of system-wide merit.

4. Learning Outcomes

Policy Direction

Technology will be used to improve learners' success and prepare them to participate in a knowledge-based and technologically advanced society.

Rationale

Technology is significantly enhancing and altering human activity, enabling individuals to live, work, learn and play in different ways. Alberta's Commission on Learning has recognized that technology is a powerful tool for improving the achievement of students. Technology facilitates greater access to the learning system by individuals whose learning options may be limited by geography, time or personal circumstances. It enhances the learning process. And, for some learners, the technology itself increases their motivation to learn.

In order to contribute in an information-rich future, learners require ICT skills to use technology tools for organization, communication, research, and problem solving. They need to understand the impact of technology on everyday lives, and need to be able to use computers and other technologies flexibly, creatively, and purposefully to support their learning. They must be prepared to understand, use and apply ICT in effective, efficient and ethical ways.

Mastering isolated ICT skills is insufficient as an end goal – students must be able to recognize what they need to accomplish, determine which technologies (if any) will assist them, and be able to apply various ICT skills in accomplishing meaningful tasks as part of the learning process. Technology is best learned within the context of applications. Therefore, ICT learning outcomes can no longer be viewed as separate from other content area and process outcomes.

This integrated approach to the instruction and application of ICT has significant impact for learners and the learning system. ICT skills can and should be embedded into content instruction and integrated appropriately into content-area outcomes across the curriculum/program. Resource selection and development should reflect the infusion of ICT into course content. Assessment of learners' progress in meeting ICT outcomes must be integrated into and aligned with other assessment of student progress. Clarity and shared understandings about the role of ICT in learning must be articulated between senior high school and post-secondary programs to ensure continuity in learning. Well-defined learner outcomes, well-designed student projects, and effective assessment strategies are required.

While learners will use and apply ICT skills within the context of their regular subjects/programs, they will also have the opportunity, through dedicated programs/courses, to explore more fully specific technologies and to prepare for related careers.

The attainment of these goals requires ongoing support and adaptation in many other areas of the learning system, such as effective pre-service programs, sustained professional development, and appropriate physical and technical infrastructures.

Outcomes

- learners will use technology to support and enhance the achievement of curriculum/program goals within relevant contexts of their regular learning activities
- increased learner participation and retention
- increased satisfaction with the learning process
- increased ability to address learning preferences and special needs
- learners will develop skills and competencies in the use of ICT and an understanding of the role of ICT in society
- learners will be critical and informed users of ICT
- learners will have opportunities to explore and prepare for careers that specialize in the use of ICT
- parents and employers will have information and tools to support learners in achieving their learning and career objectives.

Potential New Actions

- integrate ICT into a wide variety of learning experiences to ensure that all learners have equitable opportunities to develop ICT skills:
    - review K-12 ICT outcomes on a regular basis and evergreen, as appropriate, to reflect changing competency expectations
    - ensure that resource selection and development is consistent with ICT outcome expectations

- integrate assessment of students' progress in meeting ICT outcomes into other assessment of student progress
- develop mechanisms to articulate and align the role of ICT between senior high school and post-secondary programs to ensure continuity of student learning

- work with post-secondary institutions, employers, industry associations, professional organizations, industry sector councils, and other government ministries to ensure that education and training programs anticipate and address changing ICT requirements in the workforce, as is already occurring in some sectors.

5. Professional Growth

Policy Direction

Educators will develop the necessary knowledge, skills, and attributes to use technology effectively to support learning and teaching.

Rationale

Teachers, faculty and instructors are critical in ensuring effective use of technology in learning. As the report from Alberta's Commission on Learning emphasizes, it is essential that educators develop the competencies to integrate technology successfully into their teaching and to guide students in the use of technology to achieve learning goals.

The expansion of information and communication technologies in our society and the introduction of technology into the learning environment present challenges for educators in all areas of the learning system. K-12 educators are particularly impacted by:

- the Information and Communication Technology (ICT) curriculum, which is a mandatory program of studies for K-12
- the infusion of ICT outcomes within other curriculum, which requires regular classroom teachers to be skilled in using technology, rather than relying upon specialists to teach ICT skills in stand-alone technology courses
- the rollout of Alberta SuperNet, which will provide new opportunities for learners through increased access to online learning, expanded options for collaboration and professional development, and the use of new applications such as videoconferencing and remote video resources
- the development of LearnAlberta.ca digital content resources and multimedia learning objects
- the changing abilities and expectations of students, whose access to and familiarity with technology have increased.

Post-secondary educators are particularly impacted by:

- the increase in alternative delivery models, including online course management systems, videoconferencing, and a variety of synchronous and asynchronous learning tools
- competition for students in a global environment

- the changing abilities and expectations of students, who are familiar with technology tools, expect to use them in their working and learning environments, and want increased flexibility and control over their own learning.

These changes require educators to continually learn new skills, enhance existing skills, and stay informed about professional practices that integrate emerging educational technologies into changing learning contexts.

Educators need both technology skills and effective pedagogical strategies to use technology in a variety of learning and teaching environments. Currently, educators are positioned along a continuum that ranges from few basic skills and limited awareness of appropriate pedagogies to exemplary technology skills and a wide repertoire of effective teaching strategies. Attaining competency in both skills and pedagogies is a complex process that requires long-term commitment and support.

In-service and professional development strategies for practicing educators must be ongoing, integrated into curriculum, and informed by research. Effective models of professional development, and new alternatives for professional development through the use of technology, need to be widely shared.

Since educational leaders (K-12 principals, school district administrators, post-secondary deans and department heads) are fundamental to initiating and sustaining change processes such as technology integration, increasing the skills of these leaders will strengthen organizational capacity for implementation.

Faculty in pre-service programs need to model effective uses of technology in a variety of subject areas and learning environments. Close connections between faculty, pre-service teachers/instructors, experienced educators, and the educational research community will support a professional learning culture where research informs practice and practice informs research.

Outcomes

- educators are well prepared to use technologies effectively for teaching and learning
- educators have the capacity to make informed choices about the meaningful application of emerging technologies throughout their careers.

Potential New Actions

- work with teachers, parents, school authorities, and post-secondary education faculties to update the K-12 Teaching Quality Standard to better reflect teacher roles and competencies in the use of ICT for learning
- facilitate collaboration among teacher preparation programs to share models of best practice
- promote connections between pre-service, K-12, and post-secondary stakeholder groups involved in professional development for the integration of technology
- incorporate in-service plans into ministry initiatives that involve new technologies for learning and teaching.

6. Learning Delivery

Policy Direction

The learning system will use a variety of learning delivery modes to provide flexible learning options for Albertans.

Rationale

Albertans have a diversity of learning needs and expectations of the learning system. Alberta's Commission on Learning found that technology is an important mechanism for increasing access to learning programs and services, particularly for Albertans in rural and remote communities.

The growth of technology, the knowledge economy, and the imperative for lifelong learning have also contributed to the globalization of learning. Competition among learning providers is expanding, both domestically and internationally, as they seek access to new markets.

The Ministry, school jurisdictions, post-secondary institutions and industry need to have the flexibility to respond to these changing needs and expectations. The *Alberta International Education Strategy* addresses this need through the following vision:

> *Alberta will be internationally recognized as a leading provider of education, skill development and industry training, and Albertans will be well-prepared for their role in the global marketplace and as global citizens.*

While learning providers will have different strengths and priorities, it is important to ensure that the learning system is balanced and equitable, and that excellence in learning is maintained. Some of the challenges that have emerged with the growth of technology and online learning include:

- learners now have access to a vast number of learning providers, programs and environments that may not be regulated in any jurisdiction, and in some instances, may be inappropriate or of poor quality
- Alberta learning providers are seeking ways to gain international profile and recognition for their strength in online learning
- attrition rates for some online learning courses, particularly those involving little interaction with the instructor or other learners, may be significantly higher than for face-to-face courses with similar content
- there is a perception that the achievement of learners enrolled in online learning programs delivered by some Alberta school authorities may not yet meet some Ministry-established standards
- the roles of the Alberta Distance Learning Centre (K-12) and Athabasca University, which were originally designated as the Alberta learning system's distance learning providers, have become less distinct vis-à-vis other school jurisdictions and post-secondary institutions
- private sector interest and involvement in online learning is growing.

Outcomes

- learning excellence is promoted across all modes of delivery in the learning system
- diversity of choice within Alberta's learning system is maintained

- learners, parents, employers, and educators are able to identify and access online learning programs that are recognized and meet quality expectations
- Alberta is recognized as an international leader in online learning
- the integrity of government-owned curriculum and credentials is preserved.

Potential New Actions

- work with stakeholders to identify quality standards for online learning, informed by research and an appropriate professional development strategy
- work with K-12, post-secondary, and apprenticeship and industry training stakeholders to develop an Alberta-led online learning accreditation mechanism
- identify and promote best practices in online learning and other technology-based modes of learning delivery
- through the *Alberta International Education Strategy*, work with stakeholders to promote approved Alberta online learning programs in international markets
- review Ministry legislation and policies to address changing circumstances and practices brought about by the growth in online learning.

7. Learning Supports

Policy Direction

Learners, parents, educators, and employers will have the tools to identify, assess, and successfully participate in technology-enriched learning opportunities that meet their needs.

Rationale

All learners may benefit from some form of support in order to successfully use technology for learning.

In some instances, assistance with the learning process itself is required. Attrition rates for some online learning courses, particularly those involving little interaction with the instructor or other learners, may be much higher than for face-to-face courses with similar content. Some learners have indicated that certain concepts (e.g. mathematics and science) may be more difficult to grasp in an online learning environment. Other learners find that the availability of online learning resources and periodic teleconferencing or exchange of e-mail with their instructor may be sufficient to support their learning needs.

The availability of library resources is often essential to the successful completion of course requirements. Technology offers learners and educators the potential to identify and access library resources in other locations. The availability of electronic information resources can be particularly beneficial in extending library services to a greater number of learners on a timely basis. However, the cost to individual schools and post-secondary institutions to license some resources may be high.

For learners with special needs, technology may be both a barrier to participation in learning and a tool to overcome barriers to participation in learning. For instance, individuals with visual impairments and limited upper body mobility may require special voice recognition software in order to effectively use computer technology, but once this is available, their ability to fully participate in learning may increase. Other software may support cognitive development and speech rehabilitation. In addition, online learning may be an effective option for learners requiring flexible learning arrangements due to health limitations.

Timely access to technical support is critical to avoid disruption of the learning process. This may be a particular issue for learners at home and/or in remote areas, as well as school jurisdictions and large institutions with centralized services. The availability of online and telephone-based technical support services, using consultants who are familiar with the specific applications and technologies that are being used, could address many of the problems that may arise. There may be opportunities to achieve economies of scale through collaborative approaches.

Adult student financial assistance policies for online learning generally follow policies established for non-online learning programs. As a result, student financial assistance may not be available for some online learning programs, such as those programs with open-ended completion dates and many online learning programs originating outside of Canada. In addition, there is limited availability of student financial assistance for student acquisition (purchase, rent, lease, payment of technology fee) of computers, software, Internet access, and other technological expenses. Current loan ceilings may not accommodate the tuition costs of some online learning programs that are offered on a cost recovery basis.

Learners, parents, learning providers, and employers may be unfamiliar with the online learning opportunities available, and with the quality and reputability of some online programs, particularly those offered beyond their geographic region. This may limit their ability to determine whether a program or credential is appropriate to their needs. As a result, learners may choose programs that do not meet their expectations, their credentials may not be recognized for admission to higher education programs at other institutions, or they may not meet the knowledge or skill requirements of potential employers. In addition, they may incur financial losses should an online learning provider go out of business.

Outcomes

- learners have the necessary information, learning and technical supports to support their learning needs
- technology is not a barrier to learners with special needs
- expanded designation of quality online learning programs for student financial assistance purposes
- credentials obtained from quality online learning programs are recognized by learners, learning providers, employers, and professional organizations.

Potential New Actions

- work with The Alberta Library and learning stakeholders to enhance the availability of electronic library resources and services across the province
- develop information resources to assist learners, parents, learning providers, and employers to identify quality online learning programs that will meet their expectations and needs
- work with stakeholders to explore collaborative options to further support successful outcomes for learners (e.g. centralized help desk, tutorial support, expanded access to computers in the community)
- work with the federal government and other provincial/territorial jurisdictions to develop a pan-Canadian approach for the designation of online learning providers for student financial assistance

- work with the Alberta Council on Admissions and Transfer (ACAT), post-secondary institutions, and other provincial/territorial jurisdictions to expand transfer arrangements for online learning programs
- enhance the capacity of the International Qualifications Assessment Service (IQAS) to address online learning credentials
- promote prior learning assessment and recognition practices that accommodate learners who customize their learning by combining courses from several online learning providers/programs.

8. Technology Planning and Funding

Policy Direction

Funding for technology, supported by accountability measures, will be integrated into base funding for publicly-funded school jurisdictions and post-secondary institutions.

Rationale

The total cost of ownership of technology extends beyond initial expenditures for hardware and infrastructure to include the development and acquisition of learning resources, professional development, technology support, and ICT management and planning. Ongoing investment in all six categories is necessary to achieve and sustain successful outcomes.

Difficult choices may be required when other priorities, such as staffing, facility operations, student financial assistance, research, and print-based resources, compete with technology for a portion of Ministry and learning provider budgets. Accordingly, many stakeholders suggest that technology must demonstrate a 'return on investment' (e.g. enhancing learning outcomes or improving the efficiency of administrative practices).

In addition, there is a perception that current funding approaches may not fully address the unique needs and circumstances of some K-12 and post-secondary online learning providers.

Finally, a large number of stakeholder organizations and initiatives have emerged to advance and support learning and technology, many overlapping in mandate and/or seeking Ministry funding. Stakeholders have requested clarification of Ministry and stakeholder roles, and the circumstances in which the Ministry may consider investment in such stakeholder initiatives.

Outcomes

- the Ministry and learning system are accountable for investment in learning and technology
- publicly-funded school jurisdictions and post-secondary institutions have the flexibility to address technology needs within the context of local learning priorities
- funding for the delivery of online learning programs is equitable across the learning system
- Ministry investment in stakeholder learning and technology initiatives is needs-based, focuses on deliverable products and services, and involves fair and open business practices

- technology is viewed as an integrated component of the learning system
- the vision for the use of technology for learning is advanced across the learning system
- the coordination of learning and technology activity across the learning system is improved
- Ministry and stakeholder roles with respect to learning and technology are clarified.

Potential New Actions

- integrate funding for technology into base funding for publicly-funded school jurisdictions and post-secondary institutions
- work with stakeholders to develop strategies to address costs and issues associated with the implementation of system-wide priority initiatives
- work with stakeholders to develop strategies to ensure that learning system funding for online learning is equitable and supports the achievement of learning system objectives
- enhance mechanisms to exchange information with stakeholders on how they might support emerging learning system priorities/needs
- systematically identify technology needs and implications for all new Ministry and learning system initiatives
- ensure that an evaluation component is incorporated into all Ministry and learning system technology initiatives
- identify key performance indicators to measure the overall impact of technology on the achievement of learning system objectives and to measure progress toward system-wide technology integration
- review Ministry legislation, operational policies and regulations, as appropriate, for alignment with learning system objectives for the use of technology for learning.

9. Learning Information Systems

Policy Direction

Learning information systems and data collection will be efficient and effectively support learning system management.

Rationale

Quality learning system data is essential to effective learning system policy, planning and accountability. According to Alberta's Commission on Learning, the availability of "consistent, regular and timely" information about student achievement is particularly important to assess the performance of the learning system.

Within the Ministry and each school jurisdiction and post-secondary institution, there are numerous management information systems and databases for tracking learners, program operation, financial management and reporting. Some management information systems are cumbersome and costly to implement/ maintain.

Current data collection requirements are extensive and increase administrative burden. There is evidence of duplication in some areas and some data that is currently collected may not be relevant to Ministry and stakeholder needs. Appropriate data products may not be available when needed. The ability to track learner movement and exchange data across the learning system is limited.

Outcomes

- learning information systems and data collection processes are efficient and coordinated
- administrative burden is reduced
- quality data is available, as appropriate, to inform planning and accountability across the learning system
- increased ability to exchange data across the learning system
- learner privacy is protected
- learning system data is secure.

Potential New Actions

- continue to work with stakeholders to implement the Data Collection and Alberta Student Number initiatives
- develop and implement an integrated student information system for the learning system.

10. Innovation

Policy Direction:

ICT will be used to enhance collaboration and innovation in Alberta's research community.

Rationale:

Innovation and knowledge creation are essential to the prosperity of all Albertans. The growth of knowledge-intensive industries, including the ICT industry, depends largely on Albertans' capacity for innovation. Typically, innovation is a product of years of collaboration that involves exchanging knowledge among researchers and between the research community and end users. The availability of ICT offers great opportunities to enhance the speed with which knowledge is exchanged and thus contributes to increased competitiveness through innovation.

Technology also facilitates the analysis of data. Many research advances have been a direct result of the enhanced ability to apply sophisticated data analysis methods to vast quantities of data. Further, technology enables researchers to develop models and test hypotheses that might be otherwise impossible to achieve in a non-virtual environment.

Continued international competitiveness in research, however, may be limited by the ability of Alberta's broadband research networks to meet this growing need. While Alberta SuperNet will have sufficient capacity to support the use of advanced learning technologies for learning, it may not have the capability to fully support such complex research activity.

In addition, research on new information and communication technologies, applications, and processes can be both a source of revenue, as well as an important contributor to the enhancement of the use of technology in Alberta's learning system.

Outcomes

- research capability is enhanced
- collaboration within the research community is improved
- new technologies, products, processes, services and learning delivery mechanisms enhance the quality of Alberta's learning system and, where appropriate, may be commercialized.

Potential New Actions

- work with Alberta Innovation and Science, the Netera Alliance, CANARIE and other stakeholders to facilitate the development of advanced research networks to effectively support the activities of Alberta's research community
- work with the Alberta research community and the private sector to identify technological solutions to address learning system needs
- work with the Alberta research community, private sector technology and learnware developers, Alberta Economic Development, Alberta Innovation and Science, and Industry Canada to identify opportunities to promote Alberta innovation in technology in international markets.

Conclusion

Alberta is recognized internationally for the excellence of its learning system – its high quality curriculum and learning programs, teaching excellence, diversity of choice, learner achievement, collaborative relationships with stakeholders, innovative practices, and strong post-secondary research community. Used appropriately, technology can build on these strengths and enhance the learning system's ability to respond to changing learner needs and expectations. The Ministry and the learning community have a shared responsibility to ensure that investment in technology advances learning system priorities and yields the greatest benefits to learners. Alberta Learning will continue to work with stakeholders, within the context and direction established by the Learning and Technology Policy Framework, to ensure that their expertise and views inform learning system activities in this rapidly evolving area.

APPENDIX I

LEARNING AND TECHNOLOGY POLICY FRAMEWORK
Overview of Current Actions, Opportunities and Challenges

Vision

Information and communication technology supports Alberta's globally recognized learning community by enhancing learning delivery, knowledge and skill acquisition, learning system management, and innovation.

Goals

Access to quality learning opportunities is expanded / Learning is enriched / Learning outcomes are improved / Information and communication technology skills of Albertans are enhanced / The efficiency of learning system management is improved / Research and knowledge creation are advanced / Markets for learning programs, resources and services are expanded

Components	Research / Innovation	Infrastructure	Digital Content	Skills Development	Learning Delivery	Supports
Current Actions **(see Appendix II for descriptions)**	**RESEARCH** *(focus on effective use of technology for learning)* Best Practices in Technology Research on the effective use of the SuperNet Collaboration with other jurisdictions • Council of Ministers of Education, Canada (CMEC) Online Learning Research Agenda • Pan-Canadian Education Research Agenda (PCERA) • SchoolNet **INNOVATION** *(focus on facilitating post-secondary research and the development of new technologies and applications)* Alberta Informatics Circle of Research Excellence (iCORE) Pan-Canadian Learnware Industry Initiative CA*net 4	Alberta SuperNet Technology Standards and Solutions School and post-secondary institution facilities Computers for Schools partnership SchoolNet Technical Support • school district/ post-secondary institution • Ministry Alberta Colleges and Technical Institutes Consortium	LearnAlberta.ca e-Textbooks Tools 4 Teachers Digital repository partnerships with other jurisdictions Apprenticeship and industry training modules/resources Campus Alberta Repository for Educational Objects ACCESS LTA CMEC Pan-Canadian Online Learning Portal	**LEARNING OUTCOMES** ICT Program of Studies Career and Technology Studies Alberta Initiative for School Improvement ICT Classroom Assessment Tool Kit Safe and Appropriate Use of the Internet **PROFESSIONAL GROWTH** Teacher pre-service training (Faculties of Education) K-12 Teaching Quality Standard Professional development • school boards/ post-secondary institutions • Alberta Regional Consortia • TELUS Learning Connection • The Galileo Educational Network Association • The School Administrators' Technology Integration Resource	Online Learning K-12 • school jurisdiction online learning programs Post-Secondary • Alberta post-secondary institution online learning programs • eCampus Alberta • non-Alberta post-secondary online learning programs Apprenticeship • Computer managed learning (e.g. Competency Based Apprenticeship Training) Alberta Online Consortium Advisory Committee on Educational Technology	**LEARNING SUPPORTS** Alberta Learning Information Service TradeSecrets.org The Alberta Library Alberta Public Library Electronic Network International Qualifications Assessment Service Alberta Council on Admissions and Transfer Supports for Special Needs Student Financial Assistance **PLANNING AND FUNDING** Technology Planning Stakeholder Consultation K-12/Post-Secondary Funding Reviews Access Fund Technology Planning Listserv **LEARNING INFORMATION SYSTEMS** Alberta Student Number initiative Data Collection Initiative Apprenticeship, Trade and Occupation Management System Interprovincial Computerized Exam Management System

LEARNING AND TECHNOLOGY POLICY FRAMEWORK
Overview of Current Actions, Opportunities and Challenges (continued)

Components	Research / Innovation	Infrastructure	Digital Content	Skills Development	Learning Delivery	Supports
Opportunities and Challenges	**RESEARCH** Optimizing learning and technology research capacity through collaboration and coordination Informed investment in technology based on results **INNOVATION** Improving collaboration among the research community Need for advanced research networks for data analysis Identifying technological solutions to address learning system needs Promoting Alberta innovation in technology in international markets	Roll-out of Alberta SuperNet Effectively supporting the use of ICT within the learning system Need for interoperability and access by educators, learners, and administrators Increased expectations of learners, parents and employers to access the learning system from outside the learning network Identifying value and managing investment in technology Implementing cost-effective technical support/help desk Security	Sharing and adapting content for multiple purposes Digital copyright and intellectual property Standards for the classification and retrieval of digital content Role of government in digital content development	**LEARNING OUTCOMES** Infusion of ICT skills in K-12 curriculum Assessment of ICT skills Enhancing ICT skills of adult learners **PROFESSIONAL GROWTH** Identification of essential ICT skills for educators Release time for technology professional development Impact of technology on teacher/faculty roles and workloads	Ensuring that the quality of online learning is comparable to the quality of learning delivered in traditional classroom settings Profile and roles of original designated distance education providers relative to other learning providers engaged in online learning Assisting Alberta online learning providers to position themselves in global education markets Recognition of online learning credentials	**LEARNING SUPPORTS** Learning assistance for online learners Supports for special needs Technical support Student financial assistance for online learning programs and technologies **PLANNING AND FUNDING** K-12 and post-secondary technology funding mechanisms Accountability for investment in technology Leadership Policies/legislation **LEARNING INFORMATION SYSTEMS** Coordination and overlap of multiple information systems and databases Administrative burden Quality data products to inform decision-making
Potential New Actions	See discussion in previous pages.					

APPENDIX II SELECTED EXAMPLES OF CURRENT LEARNING AND TECHNOLOGY ACTIVITIES IN ALBERTA

The following initiatives are *examples* of the extensive learning and technology activity currently underway within Alberta and/or involving Alberta stakeholders. A selected number of other initiatives with implications for learning and technology activities in Alberta have also been included. Where applicable, Web addresses are provided for Alberta Learning initiatives.

1. Research

Best Practices in Technology

Alberta Learning has produced Best Practice studies to assist schools and school jurisdictions in planning, implementing and managing technology effectively. **www.learning.gov.ab.ca/technology/bestpractices**

Research on the Effective Use of the SuperNet

Alberta school jurisdictions are investigating effective approaches to learning delivery via the Alberta SuperNet. For example, through the Rural Advanced Community of Learners (RACOL) initiative, the Ft. Vermilion School Division is delivering grade 11/12 content using broadband videoconferencing. Learning Live (Red Deer Catholic Regional Division) involves the delivery of curriculum from Red Deer Notre Dame High School in Red Deer to St. Matthew School in Rocky Mountain House. The Grande Yellowhead Regional Division 3V initiative is also exploring effective use of videoconferencing. In addition, Alberta Learning has developed a SuperNet Bandwidth Estimator, which will enable school jurisdictions to plan and prepare for the implementation of the SuperNet.

Pan-Canadian Research Agendas

Through the Council of Ministers of Education, Canada (CMEC), Pan-Canadian Education Research Agenda (PCERA), and SchoolNet, Alberta Learning is working with other provincial/territorial jurisdictions to achieve common research objectives in the area of learning and technology.

2. Infrastructure

Alberta SuperNet

The Alberta SuperNet will provide 422 Alberta communities (including all schools, post-secondary institutions, and libraries) with affordable access to a high-speed broadband network by 2005. This initiative will significantly increase capacity for the use of networked applications and the delivery of online learning, enhance research, and facilitate greater communication among Alberta's learning community. **www.learning.gov.ab.ca/technology/SuperNet**

Technology Standards and Solutions

In order to operate effectively and efficiently in a provincial network environment and to ensure equitable access to technology across the province, Alberta Learning is working with stakeholders to implement province-wide technical standards. This will facilitate the interoperability of systems and support the exchange of data, files, information, content and resources across the learning system. In addition, the Ministry is working with stakeholders to achieve economies of scale through the licensing and procurement of technologies, applications, and supports with system-wide merit.

SchoolNet

SchoolNet is a collaborative initiative involving the federal government, provincial/territorial Ministries of Education, and the private sector to ensure that schools and libraries have the technological capability to support technology-enriched learning opportunities.

Computers for Schools Partnership (CFS)

CFS is a Canada-wide initiative that provides refurbished computers to schools and public libraries at no charge. Partners in the initiative include the federal government, provincial government, companies, and the volunteer sector. The Alberta program has distributed over 50,000 computers since the program's inception in 1993.

Alberta Colleges and Technical Institutes Consortium (ACTIC)

ACTIC is a collaborative post-secondary organization whose goal is to achieve economies of scale in the procurement and licensing of software.

Netera Alliance

Netera Alliance is a not-for-profit organization involving universities, research institutions, government and small and large private-sector companies to advance ICT infrastructure in Alberta. Netera operates NeteraNet – a highspeed research network that connects several Alberta research organization to CA*net4 and international research networks.

3. Digital Content

LearnAlberta.ca

LearnAlberta.ca is Alberta's online repository of learning content. In the initial phase, it will provide Alberta learners, parents, teachers and others with access to a wide range of learning resources that relate to the Alberta K-12 Program of Studies. These resources will be in the form of multimedia learning objects that will be available anywhere, anytime via linked databases and portals on the Internet. Future plans include the extension of the portal to provide resources for post-secondary programs, training in the workplace, and community-based learning.
www.learnalberta.ca

Resources that will be available through LearnAlberta.ca include:

- curriculum documents – Alberta Learning provides online access to K-12 Programs of Study and accompanying curriculum handbooks and summaries for parents
- digital content – developed by Alberta Learning to support the Alberta curriculum (e.g. English Language Arts, Mathematics, Science, Social Studies, Second Languages, Career and Technology Studies, Aboriginal Studies, Integrated Occupational Program, Health, Physical Education)
- Online Reference Centre – Alberta Learning has licensed several online resources for use by teachers, students and their parents (e.g. Canadian Encyclopedia, Electric Library Plus, SIRS Discoverer on the Web, and Grolier Online)
- National Geographic Science Centre – Alberta Learning and the National Geographic Society (NGS) have signed an agreement to digitize selected NGS videos, GeoKits, teacher support materials, student activities and glossaries. These resources will be correlated with the Alberta programs of studies for grades 1-9 natural sciences, Science 10 and Science 14/Science 24
- Alberta Virtual Science Centre (SciQ) – a multi-phase project to develop a customizable learning space that integrates broadcast television and web technologies in complementary ways to bring science to life.

e-Textbooks

Alberta Learning is working with the publishing industry to provide Alberta learners, teachers, and parents with online access to textbooks. Currently, two grade 9 Science textbooks are available online: *Science Focus 9* and *Science in Action 9*.

Tools 4 Teachers

Tools 4 Teachers is an online resource repository that has been developed by the Learning Technologies Branch of Alberta Learning and the Alberta Online Consortium.

Campus Alberta Repository of Educational Objects (CAREO)

CAREO is an Internet-based resource that contains multidisciplinary teaching materials for use by educators across the province. A joint initiative of the University of Alberta, the University of Calgary, and Athabasca University, CAREO will support flexible learning delivery by providing access to a range of digital learning content and by fostering an online community for the exchange of resources and expertise.

ACCESS/LTA

Learning and Skills Television Alberta (ACCESS/LTA) delivers K-12 and post-secondary educational programming to Albertans via television.

Apprenticeship Welding Module/Career and Technology Studies (CTS) Logistics Module

Alberta Learning is working with the Alberta Apprenticeship and Industry Training Board to produce digital learning resources to support apprenticeship and industry training and CTS modules on welding and logistics.

Council of Ministers of Education, Canada (CMEC) Pan-Canadian Online Learning Portal

Through CMEC, Alberta Learning is leading a provincial/territorial initiative to develop a pan-Canadian online learning portal that will link provincial/territorial websites/content repositories and facilitate provincial/territorial collaboration on the development and acquisition of online learning content. CANARIE is partnering with CMEC on the development of the Portal's technical environment.

Digital Content Initiatives with Other Jurisdictions

In addition to the CMEC Pan-Canadian Online Learning Portal, Alberta is developing bi-lateral and multi-lateral agreements with other jurisdictions to develop and acquire digital content, and to develop repositories for hosting such content.

4. Learning Outcomes

Information and Communication Technology Program of Studies

The Information and Communication Technology Program of Studies infuses technology concepts and skills into core subjects of the Alberta kindergarten to grade 12 school curriculum to ensure that learners enter post-secondary programs and the workforce with the knowledge and skills to participate in and fully benefit from technology-related opportunities. **www.learning.gov.ab.ca/ict/pofs.asp**

ICT Classroom Assessment Tool Kit

The *ICT Classroom Assessment Tool Kit* provides a support framework for determining student competencies in the ICT outcomes within core subjects and courses. Sample assessment tasks are provided in the subject areas of language arts, mathematics, science and social studies for grade 3, grade 6, grade 9 and 20- and 23-level courses.
www.learning.gov.ab.ca/K_12/curriculum/bySubject/ict/div1to4.pdf

Career and Technology Studies (CTS)

CTS is an optional program designed to assist Alberta secondary school students to prepare for entry into the workplace or further learning. CTS helps junior and senior high school students to:

- develop skills they can apply in daily living now and in the future
- investigate career options and make effective career choices
- use technology (processes, tools and techniques) effectively and efficiently
- apply and reinforce learnings developed in other subject areas
- prepare for entry into the workplace or further learning.

www.learning.gov.ab.ca/k_12/curriculum/bySubject/cts

Alberta Initiative for School Improvement (AISI)

AISI provides funding to school authorities to support specific local initiatives and research to improve student learning and performance. Many of these projects focus on technology integration. **www.learning.gov.ab.ca/k_12/special/aisi**

Safe and Appropriate Use of the Internet

Alberta Learning has produced Tips for Safe Internet Use, which provides teachers with practical and effective methods to ensure a safe and rewarding Internet experience for their students. www.learning.gov.ab.ca/technology/tip.asp

5. Professional Growth

Teacher Pre-Service (Faculties of Education)

Teacher pre-service programs offered by Alberta's Faculties of Education provide opportunities for Albertans preparing to become teachers to develop the knowledge and skills for the effective use of technology for learning.

K-12 Teaching Quality Standard

The Teaching Quality Standard identifies the knowledge, skills and attributes (KSAs) that teachers should possess and practice. It is used to guide teachers' professional development and teacher evaluation, and includes the ability of teachers to apply a variety of technologies to meet students' learning needs.
www.learning.gov.ab.ca/educationguide/pol-plan/polregs/421.asp

Professional Development

- **School Boards/Post-Secondary Institutions**

  The following initiatives are examples of a range of professional development supports provided by school boards and post-secondary institutions for educators.

  - **e-PD (Calgary Board of Education)**
    e-PD is an online professional development program that assists educators to incorporate online learning strategies into both classroom teaching and distance learning delivery.

  - **University of Alberta Academic Technologies for Learning**
    The Academic Technologies for Learning unit supports teaching and learning with technology through professional development, facilitating the production of resources, enhancing research and supporting distributed learning.

  - **University of Calgary Learning Commons**
    The Learning Commons supports teaching, learning, and curriculum innovation by providing faculty and staff with access to professional development, new technologies, and research on the use of technology for learning.

  - **Active Learning in Virtual Environments (ALIVE Online)**

    ALIVE Online is a professional development program, developed by the Northern Alberta Institute of Technology (NAIT), that teaches instructors how to successfully facilitate online courses. The program prepares instructors to work in a distributed learning environment and is delivered entirely online.

- **Teaching and Learning with Technology**

  Teaching and Learning with Technology is an initiative of the Alberta Regional Consortia for K-12 educator professional development. It provides professional development activities and a website with examples and links on the integration of technology into Alberta curriculum and the achievement of ICT Outcomes.

- **French Professional Development Resources**

  Alberta Learning is developing French professional development resources for the integration of ICT in the classroom. The five multimedia models will allow users to view projects developed by French immersion and Francophone teachers. The projects illustrate the integration of ICT with outcomes in core programs. Components include the planning stage, videoclips of teacher and student interviews, samples of student work, and downloadable documents.

- **TELUS Learning Connection (TLC)**

  TLC works with teacher experts in the use of technology learning to provide Alberta teachers with professional development, curriculum and ICT integration support, opportunities for collaborative project development, and interactive online learning tools for teachers and learners.

- **The Galileo Educational Network Association (GENA)**

  GENA provides leadership in the identification of effective strategies for ICT implementation and professional development in Alberta schools.

- **School Administrators' Technology Integration Resource (SATIR/RITAS)**

  SATIR/RITAS provides school administrators with information and resources on effective technology integration through the Internet in both official languages.

- **Professional Associations/Faculty Associations**

  Professional associations such as The Alberta Teachers' Association and faculty associations in post-secondary institutions provide technology professional development through workshops, conferences, and conventions.

6. Learning Delivery

K-12 Online Learning (Virtual Schools)

Approximately 4,700 full-time and 4,000 part-time students are enrolled in online learning programs offered by approximately 20 Alberta school jurisdictions. Most of the remaining 42 school jurisdictions are also engaged in some form of blended classroom/online learning delivery.

Post-Secondary Online Learning

- **Learning Programs Offered by Individual Alberta Post-Secondary Institutions**

  Many Alberta publicly-funded post-secondary institutions are involved in or exploring options to address learner needs through online learning, blended classroom/online learning delivery, and/or other forms of distance learning delivery (e.g. audio/videoconferencing).

- **eCampus Alberta**

  Through the Alberta Online Learning Association, a subcommittee of the Association of Alberta Colleges and Technical Institutes, fifteen publicly-funded colleges and technical institutes are collaborating to increase access to online learning opportunities, and reduce inefficiencies across the system, by sharing courses online. Learners will be able to access, and receive transferable credit for, a variety of courses and programs from member institutions across the province, as well as 24-hour technical support.

- **Out-Of-Province Online Learning Programs**

  Albertans may access a range of online learning programs originating outside Alberta to address their learning needs.

Apprenticeship

- **Competency Based Apprenticeship Training (CBAT)**

  Apprentices in the welder, electrician and carpenter programs have access to distance delivery of technical training at some post-secondary institutions. A computer managed learning (CML) model is used by the institutions to monitor apprentice progress through technical training. Apprentices are able to take examinations and communicate with instructors online. Competency-based apprenticeship training, using some form of CML, has been in place for 16 years.

- **Apprenticeship Alternate Delivery**

  The Alberta Apprenticeship and Industry Training Board is working with industry and post-secondary institutions to identify opportunities to enhance the delivery of apprenticeship technical training through the development of digital learning resources and, where appropriate, online learning modules.

Alberta Online Consortium (AOC)

AOC supports positive working relationships, online course development and other new initiatives for online learning through the participation of over 100 school authorities, post-secondary institutions, and private sector organizations.

Advisory Committee on Educational Technology (ACET)

ACET provides advice to senior post-secondary academic officials on emerging educational technology issues and applications, and identifies potential collaborative initiatives to address the quality, accessibility and effectiveness of learning opportunities.

7. Learning Supports

Alberta Learning Information Service (ALIS)

ALIS is Alberta's gateway for career, learning and employment information services. Features include career planning and job search assistance, occupational profiles, labour market information, databases and links to Alberta post-secondary programs and institutions, online applications for admission to post-secondary institutions and for student financial assistance, and apprenticeship and industry training information. **www.alis.gov.ab.ca**

Trade Secrets

The Alberta Apprenticeship and Industry Training website, TradeSecrets.org, provides comprehensive information on learning and working in an Alberta designated trade or occupation. Information includes how the Apprenticeship and Industry Training system works, descriptions and duties of a particular trade or occupation, and what is required to work in that trade or occupation. The requirements and process of learning a trade or occupation can also be found on Tradesecrets, as well as many more important facts for people interested in making a career in a designated trade or occupation. **www.tradesecrets.org**

The Alberta Library (TAL)

TAL is a province-wide consortium of public, university, college, technical institute, and special libraries that works collaboratively to promote universal, barrier-free access to the materials and resources in Alberta's libraries. With the Alberta Library Card, users are able to take out books from over 240 libraries across the province. This service is supported by a province-wide search engine and joint database licencing to provide more electronic information to small and medium-sized libraries.

Alberta Public Library Electronic Network (APLEN)

Learners and educators may now access the combined collections of over 300 Alberta public libraries through the APLEN, a collaborative initiative of the Government of Alberta and a province-wide consortium of university, college, public and special libraries and library organizations.

International Qualifications Assessment Service (IQAS)

IQAS provides an advisory educational assessment service which compares educational qualifications from other countries to provincial educational standards. Clients include individuals, employers, Canadian educational institutions, professional licensing bodies, organizations and other provinces.
www.learning.gov.ab.ca/iqas/iqas.asp

Alberta Council on Admissions and Transfer (ACAT)

Through ACAT, Alberta post-secondary institutions, learners, Alberta Learning, and other learning stakeholders establish polices and agreements for the admission of transfer students, prior learning assessment and recognition, and the award of transfer credit. **www.acat.gov.ab.ca**

Supports for Special Needs

Alberta school boards provide learners with special needs with the unique learning opportunities, special programs and supports they need to ensure that they reach their potential. Post-secondary institutions also offer specialized supports and services to learners with disabilities. In addition, Alberta Human Resources and Employment offers educational supports for adult learners with special needs through the Disability-Related Employment Supports initiative.
www.learning.gov.ab.ca/k_12/specialneeds

Student Financial Assistance

Through the Students Finance Board, the provincial and federal governments provide Alberta learners with needs- and achievement-based financial assistance for approved adult learning programs offered by public and private sector providers. www.alis.gov.ab.ca/studentsfinance/main.asp

Learning Resources Centre (LRC) Online Catalogue

Educators are able to order Alberta Learning authorized resources, publications, distance learning course materials, software, and other learning resources using the LRC online catalogue, which will also be linked with the LearnAlberta.ca portal. www.lrc.learning.gov.ab.ca/pro/default.html

8. Technology Planning and Funding

Technology Planning

Through their three-year plans, school jurisdictions and post-secondary institutions identify strategies to improve learning through the effective use of information and communication technology. www.learning.gov.ab.ca/technology/PlanningToolkit.asp

Stakeholder Consultation

Alberta Learning consults with and facilitates dialogue among learning stakeholders to identify best practices and address common objectives relating to the implementation of ICT for learning.

- **School Technology Advisory Committee (STAC)**

  STAC is a forum for K-12 stakeholders to provide pedagogical advice to Alberta Learning about ministry technology initiatives and to raise issues related to technology implementation in the learning system. Members include representatives from school jurisdictions, university faculties of education, the College of Alberta School Superintendents (CASS), the Alberta School Boards Association (ASBA), The Alberta Teachers' Association (ATA), and Alberta Learning.

- **K-12 Technology Advisory Group (TAG)**

  TAG is a forum for K-12 stakeholders to provide technical advice to Alberta Learning and raise issues related to integration of technology in the learning system. Members include technology leaders and experts from K-12 school jurisdictions and Alberta Learning.

- **Post-Secondary Technology Advisory Group (PSI TAG)**

  PSI TAG is a forum for post-secondary stakeholders to provide pedagogical and technical advice to Alberta Learning and raise issues related to integration of technology in the learning system. Members include representatives from colleges, universities and technical institutions, the Alberta Colleges and Technical Institutions Consortium (ACTIC), the Advisory Committee on Educational Technology (ACET), the Netera Alliance, and Alberta Learning.

Basic Learning/Post-Secondary Funding Reviews

Working with stakeholders, Alberta Learning has completed reviews of the basic learning and post-secondary funding frameworks to ensure that learning system funding is responsive, flexible and accountable.

Access Fund

The Access Fund assists post-secondary institutions to expand enrollment in specific credit programs (including apprenticeship training) in areas of high student and labour market demand. This has included the development of online learning programs and, in some instances, the technologies/applications to support expanded learning delivery.
www.learning.gov.ab.ca/college/postsecsystem/ablearning/postsecinstfund/accessfund.asp

Technology Planning Listserv

The Technology Planning Listserv is an online discussion group of Alberta learning stakeholders who are interested in the issues associated with the integration of technology into education. Participants are encouraged to share knowledge and expertise and inform others of developments in their area.
www.learning.gov.ab.ca/technology/planning_list.asp

Learning and Technology Web Site

The Learning and Technology Web site has been developed to incorporate Alberta Learning's learning and technology-related information into one easy-to-navigate location. The target audience is Alberta jurisdiction technology personnel and other members of the K-12 and post-secondary learning community who are interested in technology integration. www.lnt.ca

9. Learning Information Systems

Alberta Student Number Initiative

The Alberta Student Number is a unique identifier that will be used to manage individual learner information from K-12 through post-secondary education. The use of a common student number will improve planning and evaluation of learning delivery by providing better information on student choices and learning outcomes as students progress through the lifelong learning system.

Data Collection Initiative

Alberta Learning is working with stakeholders to reduce the administrative burden on the learning system and build government and learning provider capacity to use quality data for the purposes of planning, financial management, assessment of learning outcomes and accountability. Other objectives include collaboration for consistent standards, processes, cost-efficient technologies and security.

Apprenticeship, Trade and Occupation Management System (ATOMS)

Alberta Apprenticeship and Industry Training is developing a new electronic database to support the delivery of designated trade and occupation services. ATOMS will be learner centric, allowing learners to be more self-directed and to accomplish more through an interactive web-enabled interface. Learners will be provided a single point-of-entry approach to processes such as applying for certification or registering in a program with a training provider.

Interprovincial Computerized Examination Management System (ICEMS)

ICEMS is an automated system that supports common standards, examinations, and client information critical to the Interprovincial Standards (Red Seal) program. ICEMS stores examination items (questions) in a computer database. These items are based on and coded to specifications that reflect measurable objectives relating to a trade. The database is used to generate, at any point in time, Red Seal examinations, or a series of examinations. ICEMS is supported by a partnership among jurisdictions. It is endorsed by the Forum of Labour Market Ministers, sponsored by the Canadian Council of Directors of Apprenticeship and administered by Human Resources Development Canada.

10. Innovation

Alberta Informatics Circle of Research Excellence (iCORE)

iCORE is a Government of Alberta initiative to foster excellence in university-based research in information and communication technology (ICT). The organization operates several grant programs to develop iCORE Chairs at Alberta universities, around which world-class research teams are developed to work on fundamental and applied problems in information technology.

Pan-Canadian Learnware Industry Initiative

Alberta's learnware industry is working with Alberta Economic Development, Innovation and Science, Industry Canada, and stakeholders in other provincial/territorial jurisdictions to advance the profile of Canadian learnware developers in international markets.

CA*net 4

CA*net 4 is Canada's national optical Internet research and education network. An initiative of the Canadian Advanced Internet Development Organization (CANARIE), CA*net 4 links provincial research networks, including universities, research centres, government research laboratories, and international peer networks. CA*net 4 provides enhanced capacity for research collaboration, data exchange and analysis, distributed computing and other research activities requiring high speed bandwidth.

APPENDIX III SELECTED ALBERTA LEARNING 2004-07 BUSINESS PLAN GOALS RELATING TO LEARNING AND TECHNOLOGY*

Goal 1: High Quality Learning Opportunities for All

Strategy 1.A *Promote learning excellence through the continuous improvement of the learning system.*

Strategy 1.B *Respond to emerging labour market demands and support Alberta's transition to a knowledge-based economy.*

Strategy 1.C *Increase the level of educational attainment within Alberta through expanded access, awareness, and participation.*

Strategy 1.D *Integrate new learning technologies to support development of the learning system.*

Key Initiatives

- Implement the Learning and Technology Policy Framework, including the continued implementation of LearnAlberta.ca and SuperNet to develop multimedia and online resources for student learning.
- Implement technology standards and solutions to improve access to technology within the learning system that includes videoconferencing, central servers, and aggregated purchases.
- Increase access to learning information and services provided by the Alberta Learning Information Service.

Goal 2: Excellence in Learner Outcomes

Strategy 2.A *Improve First Nations, Métis and Inuit learner success.*

Strategy 2.B *Improve assessment of learner achievement.*

Strategy 2.C *Improve completion rates for all learners.*

Strategy 2.D *Improve learning opportunities for Albertans by enhancing transitions to work and further study for learners.*

Strategy 2.E *Enhance accessibility and promote consistent practices of learning programs for all learners.*

Goal 3: Highly Responsive and Responsible Ministry

Strategy 3.A *Work collaboratively with partners and stakeholders for the learning system.*

Key Initiatives

- Work with learning system stakeholders to further develop Alberta's international education initiatives.
- Work with intergovernmental partners, such as the Northwest Territories, British Columbia and the Western and Northern Canadian Protocol, to further develop Alberta's unique cooperative arrangements and to further strengthen Alberta's leadership in pan-Canadian initiatives through the Council of Ministers of Education, Canada; Canadian apprenticeship councils; and others.
- Develop a departmental stakeholder strategy to clarify roles and responsibilities within the learning system.
- Work with the Ministry of Innovation and Science, post-secondary institutions, and other stakeholders to further increase research and development activity within Alberta's post-secondary system.

Strategy 3.B *Promote financial sustainability of the learning system.*

Key Initiative

- Implement the K-12 Funding Framework Review recommendations for a new funding model.

Strategy 3.C *Implement an enhanced accountability framework for the K-12 system that incorporates the work of the Review Committee on Outcomes.*

Strategy 3.D *Provide Albertans with timely, accurate, and relevant information about the learning system.*

* Learning and technology initiatives are found in all areas of the Ministry business plan, but the above selected strategies identify direct linkages.

APPENDIX IV SELECTED GOVERNMENT OF ALBERTA 2004-07 BUSINESS PLAN GOALS RELATING TO LEARNING AND TECHNOLOGY*

Goal 2: Albertans will be well prepared for lifelong learning and work

Strategies

- Implement the Learning and Technology Policy Framework, including the continued implementation of LearnAlberta.ca and Alberta SuperNet to develop multimedia and online resources for student learning.
- Develop, recruit and retain the best researchers in the areas of energy, information and communications technology and life sciences to support the growth of knowledge-based industries in Alberta.

Goal 7: Alberta will have a prosperous economy

Strategies

- Promote the building of knowledge-based industries by investing in research and development, enabling technology commercialization and the introduction of new products, processes and services into the marketplace.
- Enhance the capability and capacity of Alberta's research system in the areas of energy, information and communications technology and life sciences, including investments in nanotechnology, hydrogen fuel cells, wireless communications technologies, bio-medical, bio-products, bio-energy, genomics and proteomics.
- Support the development of Alberta's economy by promoting the use of innovative applications that take full advantage of the Alberta SuperNet.

Goal 12: Alberta will have effective and sustainable government-owned and supported infrastructure

Strategy

- Complete construction of the Alberta SuperNet in 2004 to provide access for 395 rural and 27 urban communities in the province. When completed, Alberta SuperNet will provide a high-speed broadband infrastructure for universities, schools, libraries, hospitals and provincial government buildings in the province.

* Learning and technology initiatives are found in all areas of the Government of Alberta business plan, but the above selected strategies identify direct linkages.